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10 CFR 50.73

June 26, 2014

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

Calvert Cliffs Nuclear Power Plant, Unit No. 1
Renewed Facility Operating License No. DPR-53
NRC Docket No. 50-317

Subject: Licensee Event Report 2014-006, Revision 00
Reactor Trip Due to Reactor Protective System Matrix Relay Testing Pushbutton Failure

The attached report is being sent to you as required by 10 CFR 50.73.

There are no regulatory commitments contained in this correspondence.

Should you have questions regarding this report, please contact Mr. Douglas E. Lauver at (410) 495-5219.

Respectfully,

Mark D. Flaherty
Plant Manager

MDF/SMR/bjd

Attachment: As stated

cc: NRC Project Manager, Calvert Cliffs
NRC Regional Administrator, Region I
NRC Resident Inspector, Calvert Cliffs
S. Gray, MD-DNR

NRC FORM 366 (02-2014) | U.S. NUCLEAR REGULATORY COMMISSION | APPROVED BY OMB: NO. 3150-0104 | EXPIRES: 01/31/2017

Estimated burden per response to comply with this mandatory collection request: 80 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the FOIA, Privacy and Information Collections Branch (T-5 F53), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to Infocollects.Resource@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

LICENSEE EVENT REPORT (LER)

(See Page 2 for required number of digits/characters for each block)

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4. TITLE

Reactor Trip Due to Reactor Protective System Matrix Relay Testing Pushbutton Failure

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
05	01	2014	2014	- 006 -	00	06	26	2014		05000
									FACILITY NAME	DOCKET NUMBER
										05000

9. OPERATING MODE	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: (Check all that apply)			
1	☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)
	☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
	☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
	☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
10. POWER LEVEL	☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☒ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
	☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
100	☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
	☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ 50.73(a)(2)(vii)
	☐ 20.2203(a)(2)(vi)	☐ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

FACILITY NAME	TELEPHONE NUMBER (Include Area Code)
S.M. Reichard, Engineering Analyst	410-495-3648

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
E	JE	SEL	4038	Y					

14. SUPPLEMENTAL REPORT EXPECTED	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
☐ YES (If yes, complete 15. EXPECTED SUBMISSION DATE) ☒ NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On May 1, 2014 at 1016, Unit 1 experienced an automatic reactor trip from 100 percent power. Surveillance Test Procedure M-212E-1, Reactor Protective System Matrix Functional Test was being performed during the time of the trip. Two reactor trip circuit breakers opened as expected for the in-progress testing and approximately four minutes later, the remaining six reactor trip circuit breakers opened, resulting in a reactor trip. Operator actions were appropriate and in accordance with procedures. Plant response to the trip was uncomplicated. This event is being reported pursuant to 10 CFR 50.73(a)(2)(iv)(A) due to Reactor Protective System actuation. The root cause was determined to be that the contacts on the matrix relay trip test pushbuttons had silver sulfide contamination causing erratic contact resistance. Corrective actions will replace the remaining matrix relay trip test pushbuttons, assign locations codes, and develop a maintenance strategy to these components. No similar licensee event reports were identified.

NARRATIVE

I. DESCRIPTION OF EVENT:

A. PRE-EVENT PLANT CONDITIONS:

Unit 1 was operating in Mode 1 on May 1, 2014 prior to the event.

B. EVENT:

On May 1, 2014 at 1016, Calvert Cliffs Nuclear Power Plant Unit 1 experienced an automatic reactor trip from 100 percent power due to a Reactor Protective System (RPS) actuation. All safety functions were met with normal heat removal.

The trip occurred while performing Surveillance Test Procedure (STP)-M-212E-1, RPS Matrix Functional Test. Two reactor trip circuit breakers (RTCBs) opened as expected for the in-progress testing and approximately four minutes later, the remaining six RTCBs opened, resulting in a reactor trip.

C. INOPERABLE STRUCTURES, COMPONENTS, OR SYSTEMS THAT CONTRIBUTED TO THE EVENT:

There were no inoperable structures, components, or systems at the time of the trip that contributed to the event.

D. DATES AND APPROXIMATE TIMES OF MAJOR OCCURRENCES:

May 1, 1012 RTCBs 4 and 8 were opened in support of RPS matrix functional testing.

May 1, 1016 RTCBs 7, 1, 3, 5, 2, and 6 unexpectedly opened.

May 1, 1016 Unit 1 reactor trips on bus low voltage.

Operators implemented Emergency Operating Procedure (EOP)-0, Post-Trip Immediate Actions.

May 1, 1026 Operators implemented EOP-1, Reactor Trip, for an uncomplicated trip. All safety functions were met.

May 1, 1055 Operators exited EOP-1 and implemented Operating Procedure-4, Plant Shutdown from Power Operation to Hot Standby.

May 2, 1620 Matrix relay trip test pushbuttons AD and BD, the test power supply, and the test power supply socket were replaced. Post-maintenance testing was performed and the system was returned to service.

May 4, 0900 Unit 1 was returned to 100 percent power.

E. OTHER SYSTEMS OR SECONDARY FUNCTIONS AFFECTED:

There were no other systems or secondary functions affected.

F. METHOD OF DISCOVERY:

The event was self-revealing.

G. MAJOR OPERATOR ACTION:

None.

H. SAFETY SYSTEM RESPONSES:

The RPS operated as designed. There were no safety system functional failures.

II. CAUSE OF EVENT:

The Unit 1 reactor trip is documented in station condition report number CR-2014-004215. Troubleshooting identified intermittent operation of the matrix relay trip test pushbuttons due to the buildup of silver sulfide on the contacts. The root cause determined that no maintenance strategy had been applied to an unrecognized single point vulnerability. The matrix relay trip test pushbutton does not have a maintenance strategy that ensures the pushbutton is replaced before its decline in performance contributes to erratic continuity.

III. ANALYSIS OF EVENT:

This event resulted in a valid actuation of the RPS. The actuation was not part of a pre-planned sequence during testing or reactor operation. Therefore, this event is reportable in accordance with 10 CFR 50.73(a)(2)(iv)(A). Immediate notification of this event (Event Number 50078) was made on May 1, 2014, at 1150 in accordance with 10 CFR 50.72(b)(2)(iv)(B) and 10 CFR 50.72(b)(3)(iv)(A).

The Nuclear Regulatory Commission Performance Indicator for Unit 1 unplanned scrams per 7,000 critical hours is expected to increase to approximately 1.8 and remain green. No other performance indicators were impacted.

This event did not result in any actual nuclear safety consequences. The RTCBs performed as designed. The RPS performed as designed. An estimated conditional core damage probability

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NARRATIVE

of 9.5E-07 and an estimated conditional large early release probability of 4.7E-08 were calculated for this event.

IV. CORRECTIVE ACTIONS:

A. ACTION TO RETURN AFFECTED SYSTEMS TO PRE-EVENT NORMAL STATUS:

Matrix relay trip test pushbuttons AD and BD, test power supply and test power supply socket were replaced. Post-maintenance testing was performed and the system was returned to service.

B. ACTION TAKEN OR PLANNED TO PREVENT RECURRENCE:

1. No location code (Unique Equipment Identifier) exists for the matrix relay trip test pushbuttons. This pushbutton did not have nor receive a Functional Importance Determination Classification per AP-913. Further, no preventive maintenance template applies to pushbuttons. The corrective action to prevent recurrence is to assign a location code, functional importance determination, and maintenance strategy to all Unit 1 and Unit 2 matrix relay trip test pushbuttons.

2. Replace the remaining Unit 1 and Unit 2 RPS matrix relay trip test pushbuttons.

V. ADDITIONAL INFORMATION:

A. FAILED COMPONENTS:

Matrix Relay Test Pushbutton manufactured by Eaton Cutler Hammer.

B. PREVIOUS LERS ON SIMILAR EVENTS:

None

C. THE ENERGY INDUSTRY IDENTIFICATION SYSTEM (EIIS) COMPONENT FUNCTION IDENTIFIER AND SYSTEM NAME OF EACH COMPONENT OR SYSTEM REFERRED TO IN THIS LER:

COMPONENT	IEEE 803 FUNCTION ID	IEEE 805 SYSTEM ID
Matrix Relay Trip Test Pushbutton	SEL	TG

D. SPECIAL COMMENTS:

None